

SELECTIVE DEPOSITION OF MATERIALS ON CONTOURED SURFACES

ABSTRACT

The present invention is directed to a method of patterning materials, such as proteins,
5 on a contoured surface by depositing them onto protrusions on the surface and to a cell
containment device that may be constructed by this method. In one embodiment, the present
invention is directed to a method of selectively depositing a material on a substrate including
a contoured surface including a protrusion and a recess. The method includes applying a first
10 fluid to the contoured surface of the substrate and allowing the first fluid to distribute across a
portion of the contoured surface such that the first fluid contacts the protrusion and not the
recess. The method also includes allowing a first material to deposit on the substrate where
the substrate is in contact with the first fluid. Optionally, this method may further include
applying a second fluid to the contoured surface of the substrate, allowing the second fluid to
15 distribute across a portion of the contoured surface such that the second fluid contacts the
recess, and allowing a second material to deposit on the substrate where the substrate is in
contact with the second fluid. Optionally, the method may still further include applying a
third fluid to the contoured surface of the substrate, allowing the third fluid to distribute
across a portion of the contoured surface, and allowing a third material with an affinity for
20 one of the first material and the second material to deposit on the substrate only where the
one of the first material and the second material is deposited. In one embodiment of this
method the first material is a cytophobic material, the second material is a cytophilic material
and the third material is a cell.

In another embodiment, the present invention is directed to a cell containment device,
including a substrate having a contoured surface, a recess in the surface of the substrate, a
25 cytophobic material connected to the surface of the substrate outside the recess and a
cytophilic material connected to the recess.